



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 18, 2020

TO: ALL POTENTIAL APPLICANTS FOR CONSTRUCTION PERMITS OR FACILITY OPERATING LICENSES FOR NON-POWER LIQUID FUELED MOLTEN SALT REACTORS

SUBJECT: ENDORSEMENT OF APPENDIX A TO OAK RIDGE NATIONAL LABORATORY REPORT, "PROPOSED GUIDANCE FOR PREPARING AND REVIEWING A MOLTEN SALT NON-POWER REACTOR APPLICATION," AS GUIDANCE FOR PREPARING APPLICATIONS FOR THE LICENSING OF NON-POWER LIQUID FUELED MOLTEN SALT REACTORS

The U.S. Nuclear Regulatory Commission (NRC) has reviewed and endorses, subject to the clarifications identified below, Appendix A, "Part 1, Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power MSRs: Format and Content," of the report titled, "Proposed Guidance for Preparing and Reviewing a Molten Salt Non-Power Reactor Application" (ORNL/TM-2020/1478) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20219A771), prepared by Oak Ridge National Laboratory (ORNL), as guidance for use by applicants for non-power liquid fueled molten salt reactors. Specifically, an applicant for a construction permit or a facility operating license for a non-power liquid fueled molten salt reactor under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Paragraph 50.21(c) may use Appendix A of the report as guidance for the format and content of the application, including the technical information required by 10 CFR 50.34, "Contents of applications; technical information," and other regulations.

The new guidance in Appendix A of the ORNL report will help applicants provide the information that 10 CFR 50.34 requires in applications for non-power liquid fueled molten salt reactors and thereby support predictable, efficient, and timely reviews by the NRC staff. The existing guidance in NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content" (ADAMS Accession No. ML042430055), does not address molten salt reactor technology, which differs from light water reactor technology in significant ways. This new guidance tailors the NUREG-1537 guidance on the format and content of applications to include additional information specific to molten salt reactor technology and remove information related to light water reactors that is not relevant to non-power liquid fueled molten salt reactors.

The NRC staff finds the new guidance in Appendix A to be consistent with current regulations applicable to non-power reactors, including the regulations in 10 CFR Part 20, "Standards for Protection Against Radiation," 10 CFR Part 50, 10 CFR Part 55, "Operators' Licenses," and 10 CFR Part 100, "Reactor Site Criteria," (which applies to testing facilities) and acceptable for use subject to the following clarifications:

- Instead of the discussion of 10 CFR 50.59, “Changes, Tests, and Experiments,” on pages 10-1 and 10-2, which is based on an older version of the regulation, users must refer instead to the current 10 CFR 50.59 criteria for making determinations regarding which changes require prior NRC approval.
- The discussion of 10 CFR 55.53, “Conditions of licenses,” requirements for reactivation of operators’ licenses on page 12-8 should state that, for test and research reactors, 10 CFR 55.53(f)(2) *requires* certification that the licensee completed a minimum of 6 hours of licensed activities prior to license reactivation.
- The term “non-power production and utilization facilities” or “NPUFs,” used in Appendix A is not currently in NRC regulations, but is proposed to be included in NRC regulations as part of a draft final rule currently under consideration by the Commission.¹

As discussed in the ORNL report, the guidance in Appendix A may be used in conjunction with the existing guidance in NUREG-1537, Part 1, “Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content,” and “Interim Staff Guidance Augmenting NUREG-1537, Part 1, ‘Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content,’ for Licensing Radioisotope Production Facilities and Aqueous Homogeneous Reactors” (ADAMS Accession No. ML12156A069).

Appendix B of the ORNL report proposes guidance for the NRC staff to use to review an application to construct or operate a non-power liquid fueled molten salt reactor. The NRC staff does not endorse Appendix B as guidance at this time but plans to incorporate it, as appropriate, in the revision of NUREG-1537 scheduled in 2021. In the interim, the information in Appendix B of the report and in the existing guidance in NUREG-1537, Part 2, “Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria” (ADAMS Accession No. ML042430048), and “Interim Staff Guidance Augmenting NUREG-1537, Part 2, ‘Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria,’ for Licensing Radioisotope Production Facilities and Aqueous Homogeneous Reactors” (ADAMS Accession No. ML12156A075), can generally inform applicants about the review process.

The main body of the report provides background information and an explanation of how the authors developed the report. This information may be of interest to applicants but should not be considered guidance.

In an effort to provide clarity and transparency, the NRC staff posted the report on the NRC public webpage at <https://www.nrc.gov/reactors/new-reactors/advanced.html#advRxRef> on August 19, 2020, as reference material and also informed approximately 100 industry representatives of its availability during public meetings held on August 20 and 25, 2020. During this timeframe, the NRC staff also informed one known potential applicant of the availability of the report. The NRC staff presented its plans to endorse the report as guidance and welcomed oral feedback from external stakeholders at an October 1, 2020, public meeting, which was attended by many of the same stakeholders that attended the previous meetings. The NRC did not receive any feedback.

¹ SECY-19-0062, “Non-Power Production or Utilization Facility License Renewal,” dated June 17, 2019 (ADAMS Accession No. ML18031A001)

The NRC staff is making the guidance in Appendix A of the ORNL report available for use in an expedited manner in response to recent stakeholder interest in advanced reactor development, including non-power liquid fueled molten salt reactors, and to promote predictable, efficient, and timely reviews of licensing applications for these facilities. The NRC staff plans to incorporate the report, as appropriate, in the revision of NUREG-1537 scheduled in 2021. This process will include a formal public comment period.

Backfitting

The NRC's backfitting provisions for reactors are found in 10 CFR 50.109, "Backfitting." The regulatory basis for 10 CFR 50.109 was expressed solely in terms of nuclear power reactors. The NRC's Advanced Notice of Proposed Rulemaking, Policy Statement, Proposed Rules, and Final Rules for amendments to 10 CFR 50.109 in the 1980s involved only nuclear power reactors. As a result, the NRC has not applied 10 CFR 50.109 to research reactors or testing facilities licensed under 10 CFR 50.21(c). Because this letter endorses guidance for use only by non-power liquid fueled molten salt reactors licensed under 10 CFR 50.21(c), the NRC did not apply the backfitting provisions of 10 CFR 50.109 to this guidance and any changes the NRC makes to its endorsement of this guidance in NUREG-1537 would not constitute backfitting. For facilities licensed under the authority of Section 104.c of the Atomic Energy Act of 1954, as amended (AEA), in accordance with the regulations in 10 CFR 50.21(c), the Commission is directed to impose the minimum amount of regulation on the licensee as will permit the Commission to fulfill its obligations under the AEA to promote the common defense and security and to protect the health and safety of the public, and will permit the conduct of widespread and diverse research and development. With this letter, the NRC staff is meeting this standard because the guidance does not create or change any regulatory requirements and applies only to applicants for new non-power liquid fueled molten salt reactors licensed under the authority of Section 104.c of the AEA.

Paperwork Reduction Act Statement

As endorsed by this letter, Appendix A of the report provides voluntary guidance for implementing the mandatory information collections in 10 CFR Part 50 that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). This information collection was approved by the Office of Management and Budget (OMB), under control number 3150-0011. Send comments regarding this information collection to the FOIA, Library, and Information Collections Branch (T6-A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e mail to Infocollects.Resource@nrc.gov, and to the OMB reviewer at: OMB Office of Information and Regulatory Affairs (3150-0011), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street, NW, Washington, DC 20503; e-mail: oir_submission@omb.eop.gov.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

Congressional Review Act

This letter endorsing Appendix A of the ORNL report as guidance is a rule as defined in the Congressional Review Act (5 U.S.C. 801-808). However, OMB has not found it to be a major rule as defined in the Congressional Review Act.

Opportunity for Comment

In accordance with 10 CFR 2.804, "Notice of proposed rulemaking," paragraph (e)(2), the NRC staff will accept comments on this letter and the guidance in Appendix A of the ORNL report for a period of 30 days after the date of this letter. In accordance with 10 CFR 2.804(f), a statement will be published in the *Federal Register* containing an evaluation of the significant comments and any revisions of the guidance made as a result of the comments and their evaluation. Please address comments to:

Mr. William B. Kennedy, Project Manager
Non-Power Production and Utilization Facility Licensing Branch
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Prospective applicants are encouraged to engage with the NRC staff in public meetings prior to submitting an application to construct or operate a non-power liquid fueled molten salt reactor to discuss the applicability of NRC regulations and guidance to their specific facility. If you have any questions regarding this letter, the report, or other matters related to licensing non-power liquid fueled molten salt reactors, please contact Mr. William B. Kennedy at (301) 415-2313, or by e-mail at William.Kennedy@nrc.gov.

Sincerely,

/RA/

Mohamed Shams, Director
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

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